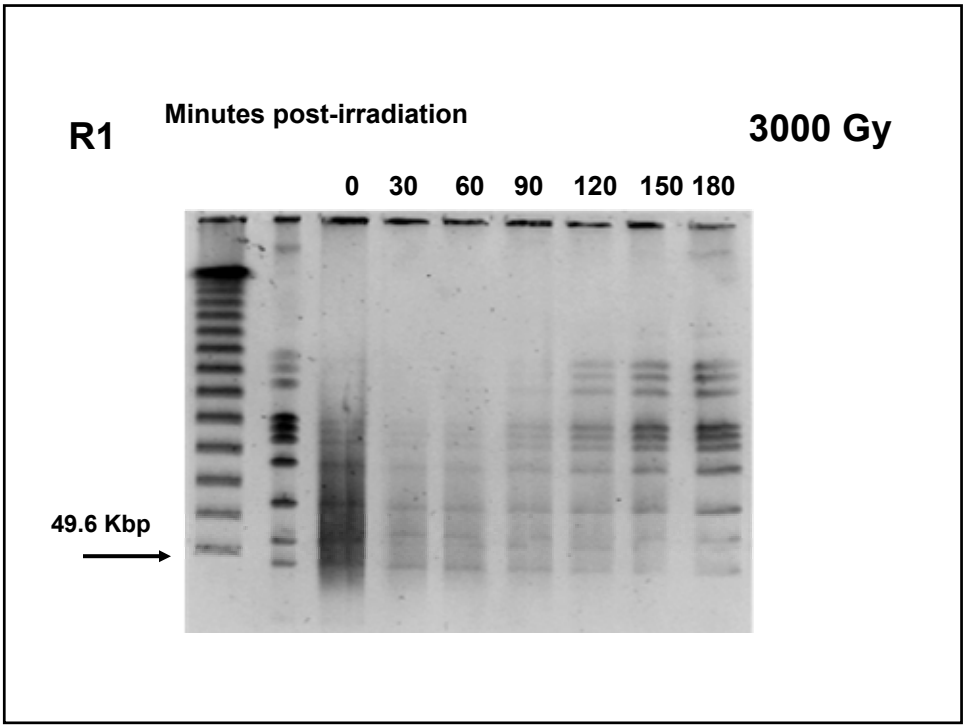
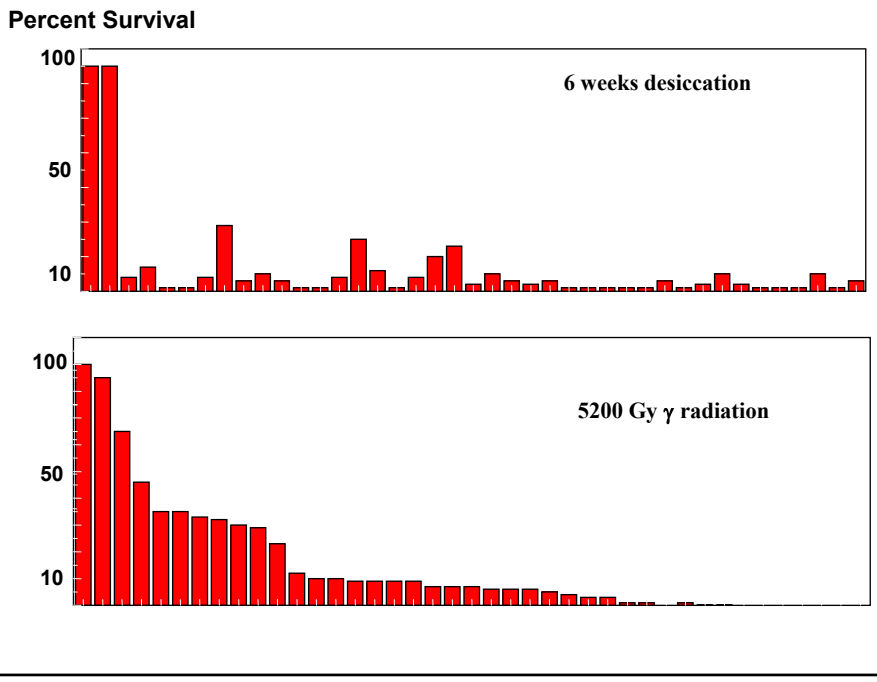
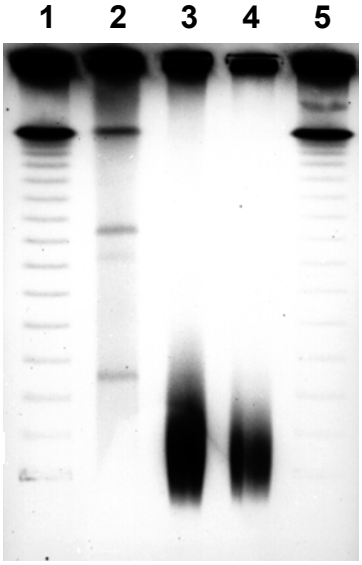

R1
Minutes post-irradiation
3000 Gy
0 30 60 90 120 150 180
49.6 Kbp


Percent Survival
100
50
10
6 weeks desiccation
100
50
10
5200 Gy γ radiation



***D. radiodurans* R1**

2 - untreated
3 - 6 wks desiccation
4 - 5000 Gy g radiation

Experimental Design

- **Expose 1 liter of an exponential phase culture of *D. radiodurans* R1 to 3000 Gy γ radiation.**
- **Desiccate cells harvested from a1 liter of an exponential phase culture of *D. radiodurans* R1 for two weeks at < 5% relative humidity.**
- **Monitor recovery using the *D. radiodurans* R1 microarray created by Scott Peterson and colleagues at The Institute for Genomic Research.**
- **Total RNA was isolated at 40, 70, and 110 minutes after treatment .**

Progress

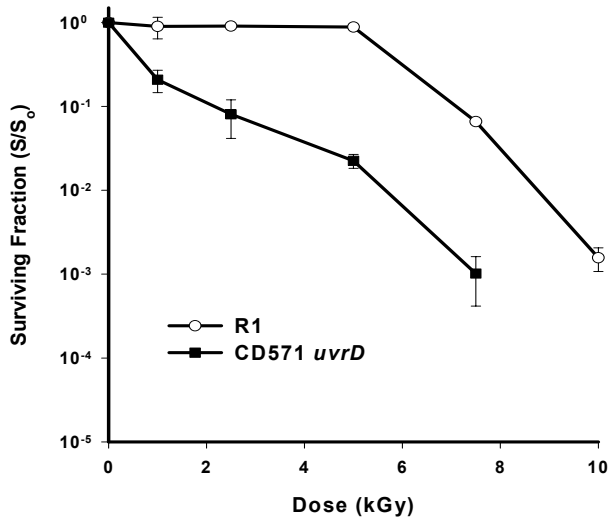
- **After examination of data from six trials, we consistently detect 64 transcripts that are induced as cultures of *D. radiodurans* R1 recover from exposure to 3000Gy g radiation. Only 20 of these transcripts exhibit Cy3/Cy5 ratios in excess of 5.**
- **Of the 64 transcripts detected following irradiation, 10 can be associated with DNA repair or recombination by sequence similarity.**
- **Of the 64 transcripts detected following irradiation, 21 cannot be associated with a protein of known function by sequence similarity.**

Progress

- **After examination of data from two trials, we detect 115 transcripts that are induced as cultures of *D. radiodurans* R1 recover from desiccation. Only 15 of these transcripts exhibit Cy3/Cy5 ratios in excess of 5.**
- **Of the 115 transcripts detected following desiccation, 28 are also induced following exposure to ionizing radiation.**

DNA Replication, Repair, and Recombination

ORF	Putative Identity	Cy3/Cy5 (3000Gy γ/unirradiated)		
		Time Post-Irradiation		
		40 min	70 min	110 min
DR0596	ruvB,	13	10	-
0906	gyrB,	13	8	-
1771	uvrA,	4	-	-
1775	uvrD,	3	-	-
1902	recD,	-	3	-
1913	gyrA,	15	7	-
2275	uvrB,	-	6	-
2339	2`-5` RNA ligase, putative	7	5	-
2340	recA	4	5	4
A0346	DNA repair protein, putative	16	14	4



Hypothetical Proteins

ORF	Putative Identity	Cy3/Cy5 (3000Gy γ/unirradiated)		
		Time Post-Irradiation		
		40 min	70 min	110 min
DR0003		-	34	4
0070		34	20	4
0194		4	-	-
0227		4	-	-
0326		-	12	4
0423		-	41	6
0491		4	-	-
0613		3	-	-
0905		14	7	-
1263		-	3	-

Hypothetical Proteins

ORF	Putative Identity	Cy3/Cy5 (3000Gy γ/unirradiated)		
		Time Post-Irradiation		
		40 min	70 min	110 min
1263		-	3	-
1264		6	6	-
1422		4	-	-
1439		-	9	-
2086		-	3	-
2173		-	8	-
2308		4	-	-
2441		-	11	3
B01004		4	-	-
C0016		-	5	-

Progress

- **Five open reading frames are strongly expressed under both conditions.**

  DR0003
  DR0070
  DR0326
  DR0423
  DRA0346

- **The gene products from these open reading frames are of interest because they may represent novel proteins involved in DNA double strand break repair.**

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